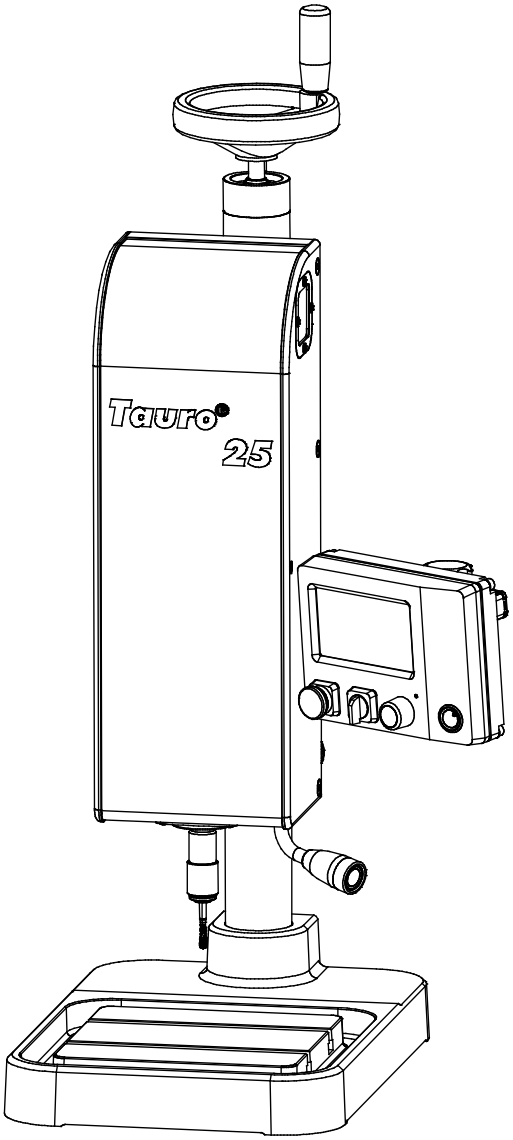
User Manual

Thread Tapping Machine

Tauro® *8 /25 / 83*



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This user manual is an integral part of the

Typ ***Tauro®***: _____

Serial No: _____

Year of manufacture: _____

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EC Declaration of Conformity

Name and address of the manufacturer:

Taurox e. K.
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Germany

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and exludes components which are added and/or operations carried out subsequently by the final user. The declaration is no more valid, if the product is modified without agreement.

Herewith we declare, that the machinery described below

product denomination: Thread tapping machine
model / type: ***Tauro® 8 /25 / 83***

is complaying with all essential requirements of the Machinery Directive 2006/42/EC.
In addition the partly completed machinery is in conformity either the EC Directives 2014/30/EC relating to electromagnetic compatibility.

Harmonised Standarts used

DIN EN ISO 12100:2011-03	Safety of Machinery
EN 60204-1 :2007	Electrical equipment of machines
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments
EN 55011:2009 + A1:2010, section 6.2.2	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN 61000-6-2 :2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-3-2:2006 + A1:2009 + A2:2009	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection

The person authorised to compile the relevant technical documentation (must be established within EU)

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Rattiszell, 17.06.2014	Janich Martin, owner of a firm	
Place, Date	suname, first name and function of signatory	Signature

Significance of this operator's manual

This operator's manual is an integral part of the thread tapping machine ***Tauro® 8 /25/83***.

- Must be kept in a way that it is always at hand until the thread tapping machine will be disposed of.
- Pass this manual on if the thread tapping machine is sold or loaned/leased out.

Read this manual before installation and operation.
This protects you and avoids damages at the machine.

In any case you encounter difficulties to clearly understand the manual, please contact the manufacturer.

Only persons with adequat technical knowledge and knowledge of this machine are allowed to install and operate the machine.

Missing or inadequate knowledge of the manual results in the loss of any claim of liability on part of ***Taurox e. K.***.

Taurox e. K. reserves the right to make alterations to its products in the interest of technical progress. These alterations need not be documented in every single case.

Disclaimer

This manual and the information contained herein have been compiled with due diligence. ***Taurox e. K.*** shall not be liable for errors contained herein or for incidental or consequential damage in connection with the furnishing, performance, or use of this material.

Description of symbols

General description of symbols

Indicates dangers which can be followed by death, heavy personal injury or substantial property damage.

Indicates a possible risk which can be followed by death, heavy personal injury or substantial property damage.

Indicates a possible risk which can be followed by minor personal injury or property damage.

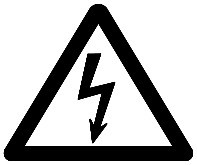
Indicates a possible impending situation, which can be followed by damages at the product or in the environment.

It communicates requirements which have to be absolutely considered for an accurate operation.

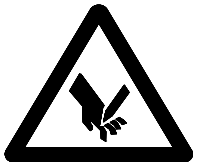
Indicates applications and other useful information. It shows hints and advices for an efficiant use of the machine and operation, to prevent additional work.

Additional symbol explanation

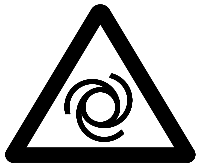
The additional symbols include always a “general symbol“.



Warning of dangerous high voltage:
Indicates danger of life through high operating voltage and electrial shock, which can be followed by death.
This symbol includes also **„Danger“**.

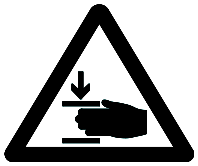


Warning of cutting damage:
Indicates a danger of sharp objects which can be followed by cuts.
This symbol includes also **„Warning“**.



Warning of automatically running:
Indicates a possible risk which can be followed by injuries.
This symbol includes **„Warning“**.

Warning of hot surface:
Indicates a possible risk which can be followed by burnings.
This symbol includes **„Caution“**.



Warning of hand injuries:
Indicates a possible risk, which can be followed by hand injuries and crush injuries.
This symbol includes **„Warning“**.

Use eye protection:
Always wear eye protection! Indicates a possilbe risk which can be followed by heavy injuries at the eyes or can be followed by blindness.
This symbol includes **„Warning“**.

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1 Safety instructions

1.1 General information

This machine is conform to all general safety instructions and norms. To the security of the user was payed special attention.

For the user are additional valid the:

- Relevant accident prevention regulations,
- General accepted safety related norms,
- EG-norms or other country specific regulations.

1.1.1 Usage as agreed upon

The appropriate usage encludes the procedure like mentioned in this manual. It is only allowed to use the machine within the limits noted in the datas in this manual (see chapter: "Technical Data").

1.1.2 Usage other than agreed upon

To use the machine in different ambient conditions as mentioned in the chapter “Operation conditions” ask the manufacturer.

1.1.3 Modifications and alterations

Based on security reasons it is not allowed to do alterations and changes at the machine and its functions.
Changings at the machine which are not allowed by the manufacturer are followed by the exclusion of liabilty to the company ***Taurox e. K.***.

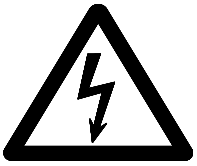
1.1.4 Repairs and servicing

It is not allowed to repair the machine by the user. The machine has no parts which can be repaired by the user.
The machine has to be send to ***Taurox e. K.*** for repair.

1.1.5 Decommissioning and disposing

For the decommissioning and the disposal, the environment regulations are valid of the country the user company is placed.

1.2 Ensure your own safety / emergency stop



- Disconnect the machine of the power supply system before starting maintenance work. This avoids accidents based on electrical voltage and movable parts.
  Please see chapter „Restrisks“
- It is not allowed to override or avoid protection- and safety devices like protection cover and machine cover parts or thermic protection switches, emergency stop switch and motor switch.

Danger

- Dismantled protections like i.e. machine cover, fuses, emergency stop switch, motor protection switch, have to be reinstalled and to be checked for a proper function.
- The operator control modul with emergency stop switch and motor switch has to be installed in a convenient distance of the user!

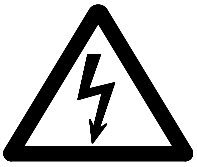
1.2.1 Malfunctions

- In case of troubles or other damages immediately disconnect the machine of the power supply system.
  Pay attention to chapter „Residual Dangers“
- Report troubles or other damages immediately to a responsible person or to the company **Taurox e. K.**.
- Secury the machine against improper or accidentially use.

1.2.2 Information signs and labels

- Obligatory intent letterings, signs and labels and let them be readable.
- Renew damaged or not any longer readable signs and label

1.2.3 Earthing procedure



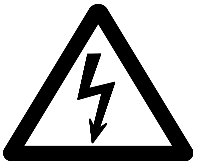
Connect the earth wire to the safety plug (min. 1,5 mm²) and the pin of the casing earthing to the control unit.

It is not possible to use a fault Residual Current Device (RCD) to the power supply.
Nevertheless a residual current protective device was installed, it switches the machine off despite there is no malfunction.
If it is required to use the machine with a leakage current protector an isolation transformer has to be used.

1.3 Residual dangers

1.3.1 Hazards during operation

Danger caused of high operation voltage!



Voltages up to DC 325V appearing which are causing danger of life!
These voltages lead to muscular cramps, burnings, unconsciousness, breathing arrest and death.

- During operation hold all parts of the machine closed.
- Do not open the machine.

Danger caused of hot surface!

During operation surfaces in the machine and tools can get hot.
The internal parts can reach a temperature up to 90°C.

- Never touch internal parts in the cool down phase after switch off.
- Never touch tools directly after operation in the cool down phase.

Danger in explosive substances areas!

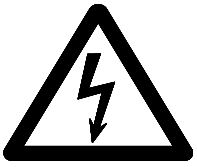
- Do not use the machine in explosive substances areas.

Danger by mechanical force influence!
The machine has a circulating spindle and movable parts.

- Depending on application fix additional protection cover.
- Secure that in case of unwantedly moving of the spindle no personell hazard can happen.
- Do not remove neccessary protection covers.
- Do not wear gloves or loose clothing because of danger to hang in the rotating working spindle.
- In case of too long hears wear a suitable headgear (hairnet).
- Always wear saftey glasses.
- Never touch the rotating spindle.
- Before changing the tool switch off the drive spindle by the motor switch off.

1.3.2 Hazards after power is turned off

Danger by electric shock!



Capacitories in the machine carries dangerous residual voltage up to 5 additional minutes after switch off the machine.

- Always wait min. 5 minutes after switch of the machine before disconnecting the machine of the power supply system.
- To open the machine wait min. 10 min. after switch off the machine before disconnecting the machine of the power supper. (only personal with electrotechnical qualification are allowed to do).

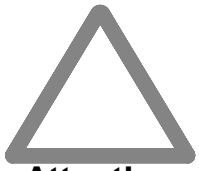
1.4 Instructions on EMI

The machine is designed for use in industrial.

2 Technical data

2.1 Electrical specification

• Voltage of the rated power supply	~ U_{eff} = 230V
• Power supply tolerance	U_{eff} = 207V … 253V (-10% … +10%)
• Frequency	48-62Hz
• Overload protection	Fuse 5A T (time-lag) Type: (G-fuse 5x20)
• Leakage current	>3,5mA (See chapter: "Earthing procedure")
• Power input permanent load	max. 615W
• Power input non-operated	< 40W
• Digital inputs	3 pcs 24V
• Digital outputs	10 pcs 24V / 3,6W (short-circuit proof)



Attention

Attention: Time between switch off and on of the main supply:
If the driving unit was used with motor power (torque and engine speed of the motor) the starting current limitation has to cool down 2 - 3 minutes after switching off the machine. The part which causes the starting current limitation can be ruined if the a.m. was not cared about.

2.2 Mechanical specification

• Spindle travel Tauro® 8 max.	65mm
• Spindle travel Tauro® 25 / 83 max.	90mm
• Thread depth Tauro® 8 max.	55mm
• Thread depth Tauro® 25 / 83 max.	80mm
• Depth accuracy	0,1mm
• Finish	RAL 7035 / light grey RAL 5005 / signal blue
• Travel	+/- 30°

2.2.1 Mechanical specification Tauro® 8

- Thread capacity
  Thread cutting - blind hole 1,5 x D M0,5 – M3; X6CrNiMoTi17-12-2; 1.4571
  Thread cutting - blind hole 2,0 x D M0,5 – M4; AlMg4,5Mn / 3.3547
- Torque range 0,030 - 0,800Nm
- Rpm range 50 – 3000rpm
- Travel height adjustment 0 - 323mm (Column 650mm)
- Spindle / tool holder Collet holder ER11

2.2.2 Mechanical specification Tauro® 25

- Thread capacity
  Thread cutting - blind hole 1,5 x D M1 - M5; X6CrNiMoTi17-12-2; 1.4571
  Thread cutting - blind hole 2,0 x D M1 - M6; AlMg4,5Mn / 3.3547
- Torque range 0,1 - 2,50Nm
- Rpm range 50 – 3000rpm
- Travel height adjustment 0 - 330mm (Column 650mm)
- Spindle / tool holder quick change holder 0

2.2.3 Mechanical specification Tauro® 83

- Thread capacity
  Thread cutting - blind hole 1,5 x D M2 - M8; X6CrNiMoTi17-12-2; 1.4571
  hread cutting - blind hole 2,0 x D M2 - M10; AlMg4,5Mn / 3.3547
- Torque range 0,30 - 8,30Nm
- Rpm range 50 – 2400rpm
  max. 2000rpm from 6,80Nm
- Travel height adjustment 70 – 415mm (Column 750mm)
- Spindle / tool holder quick change holder 1

2.2.4 Weight

- Machine pedestal approx. 14,3kg
- Column 650 mm with column flange approx. 7,5kg
- Column 750 mm with column flange approx. 9,2kg
- Control unit approx. 8,3kg
- Operating panel approx. 1,2kg
- Tauro® 8 (Drive unit without spindle feed system) approx. 9,7kg
- Tauro® 25 (Drive unit without spindle feed system) approx. 9,9kg
- Tauro® 83 (Drive unit without spindle feed system) approx. 13,9kg

2.3 Physical dimensions

2.3.1 Physical dimensions of the control unit

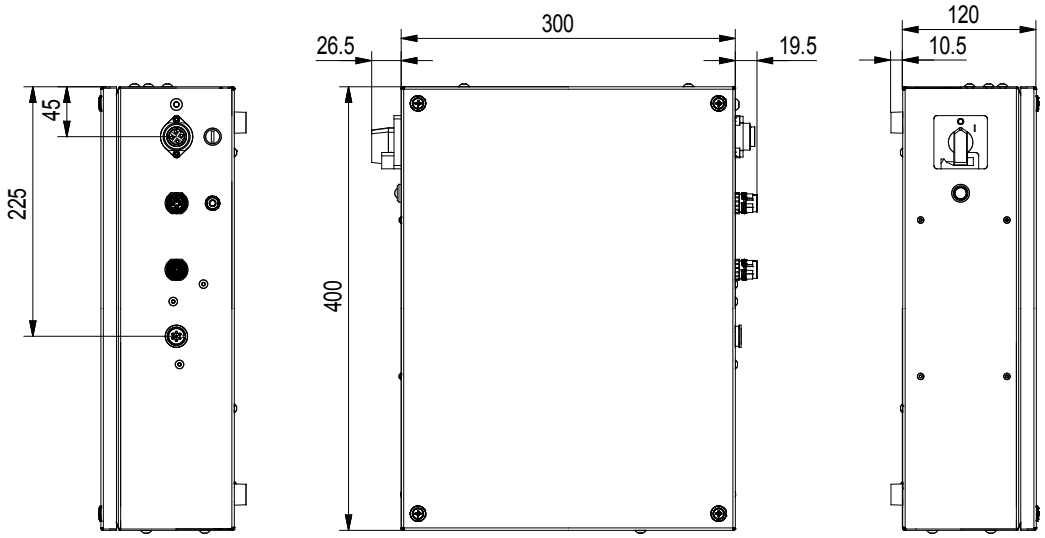


Fig.: 2.1 View of the control unit

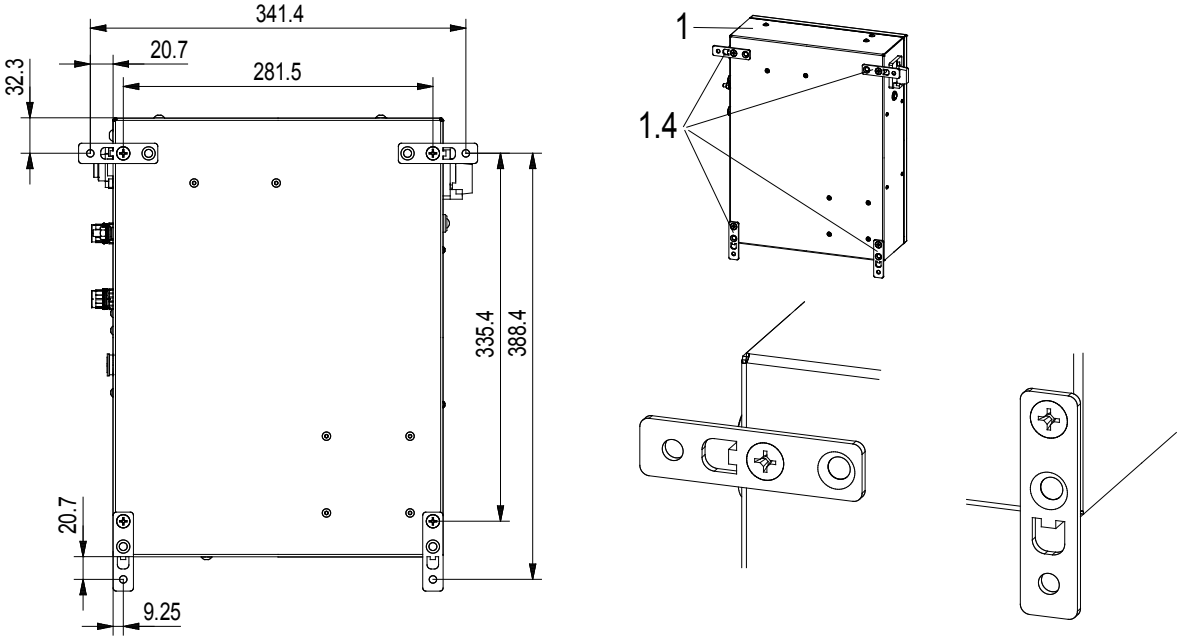


Fig.: 2.2 Rear view of the control unit with fixation to the wall (1.4) (Component part)

2.3.2 Physical dimensions of the machine pedestal

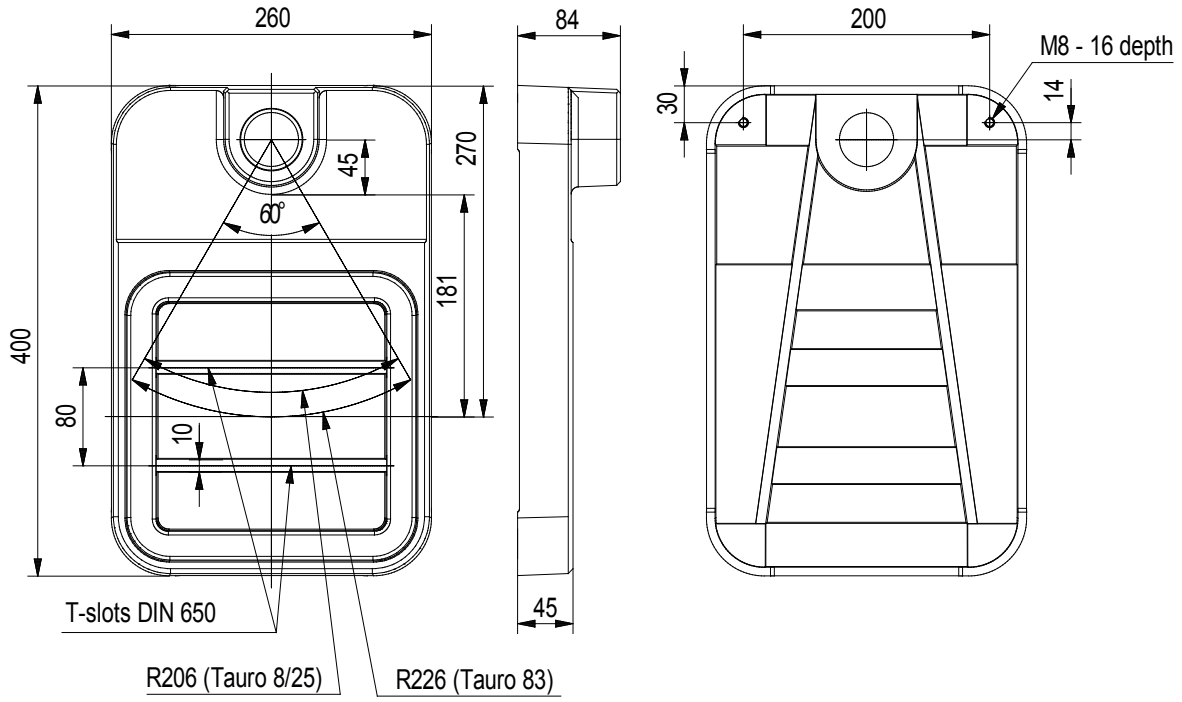


Fig.: 2.3 View of the machine pedestal

2.3.3 Physical dimensions of the Tauro® 8

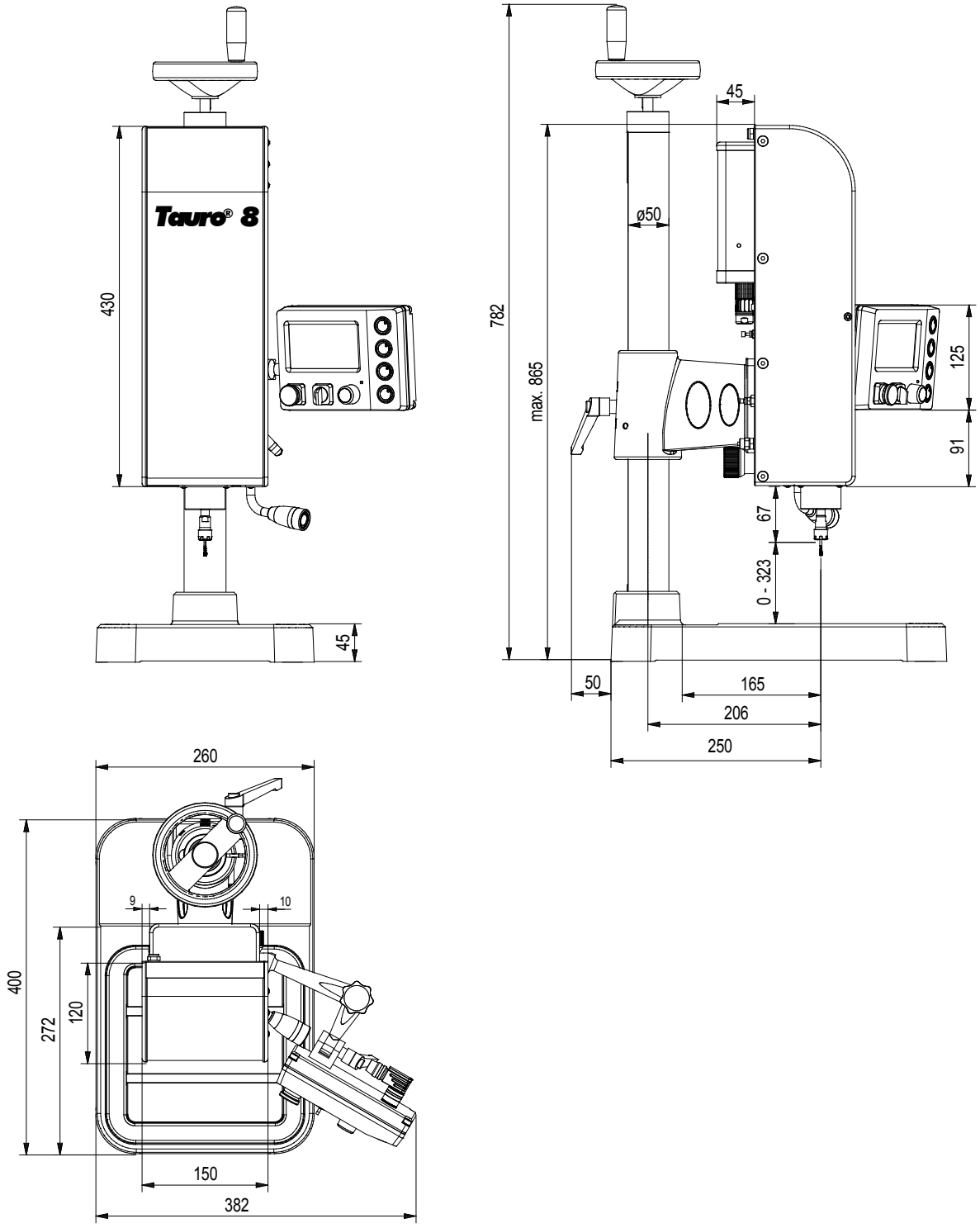


Fig.: 2.4 View of the thread tapping machine Tauro® 8

2.3.4 Physical dimensions of the Tauro® 25

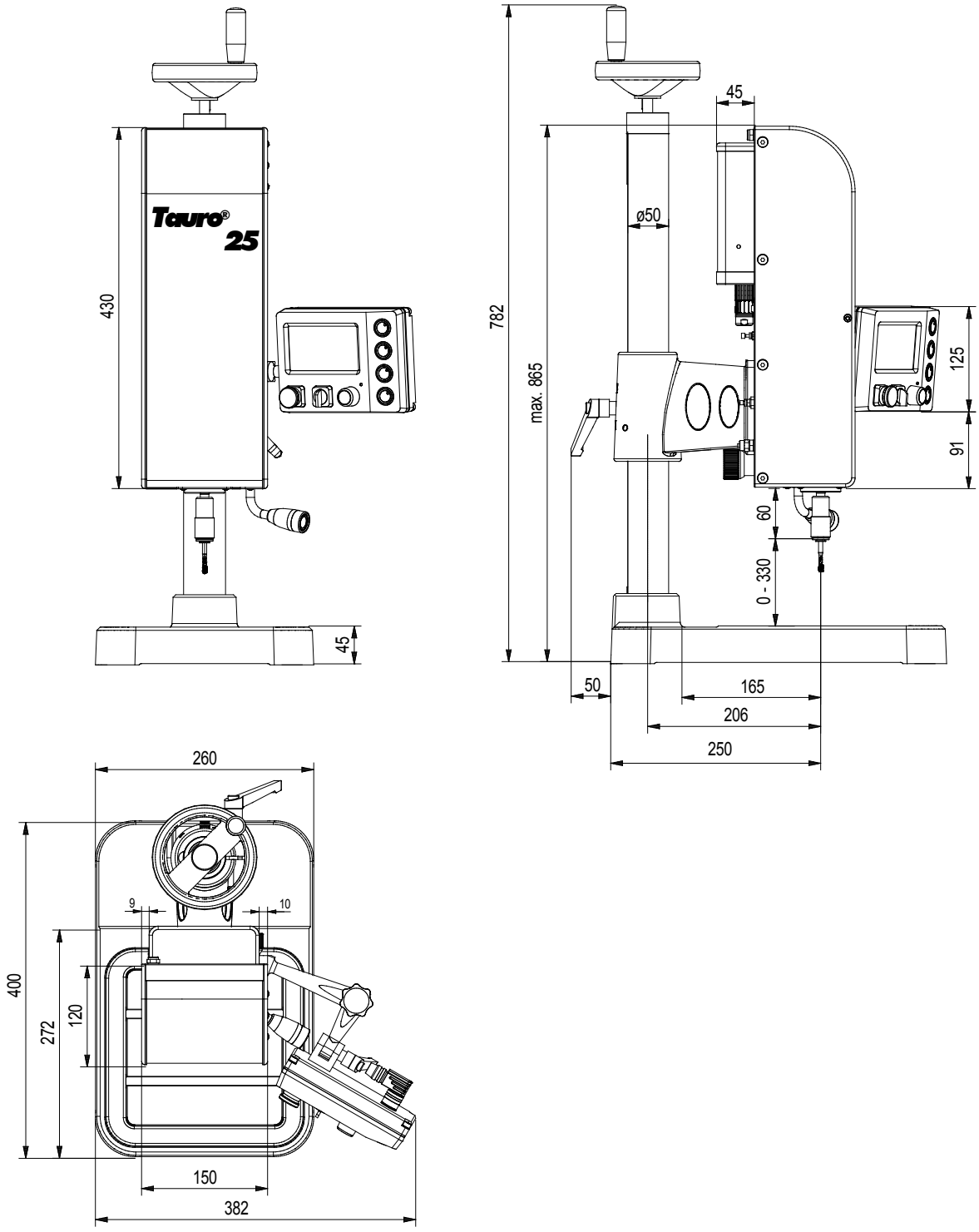


Fig.: 2.5 View of the thread tapping machine Tauro® 25

2.3.5 Physical dimensions of the Tauro® 83

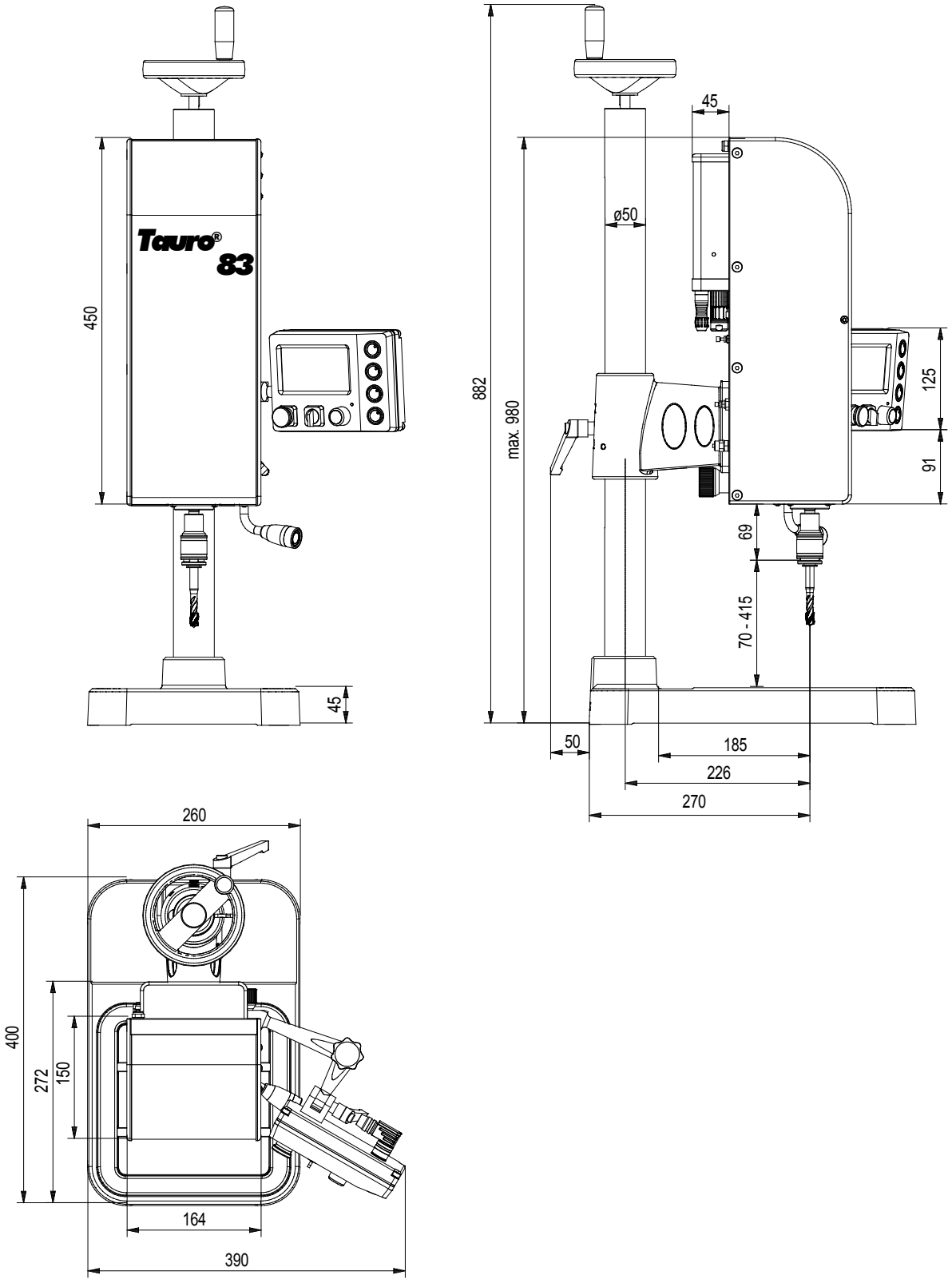


Fig.: 2.6 View of the thread tapping machine Tauro® 83

2.4 Operating conditions

• Transport conditions	Temperature: -25°C - 70°C Air humidity: 5% - 95% (non-condensing)
• Storage conditions	Temperature: -25°C - 70°C Air humidity: 5% - 95% (non-condensing) Maximum storage period: < 1 year without restrictions
• Ambient temperature	5 - 45°C
• Atmospheric moisture	5% - 80% (non-condensing)
• Operating altitude	1000m max. above sea level from 1000 to 2500m above sea level; derating 1.5 % per 100m increase in altitude.
• Degree of protection	IP 54
• Protection class	I
• Corrosion immunity / Chemical resistance	No special protection against corrosion. Ambient air must be free from higher concentrations of acids, alcaline solutions, corrosive agents, salts, metal vapours, or other corrosive or electroconductive contaminants.
• Compressed-air (unoiled)	
Spindle feed system	58 – 116psi (4 – 8bar)
Minimum lubricant unit	58 – 116psi (4 – 8bar)

3 Installation / Commissioning

3.1 Scope of Delivery

(1) **C**ontrol **U**nit (**CU**)
(2) **O**perating **P**anel with hinged bracket (**OP**)
(3) **D**rive **U**nit Tauro® 8 / 25 / 83 (**DU**)
(4) Machine pedestal
(5) Column with travel height adjustment

- Mains cable (2m)
- Motor power cable CU-DU (2m)
- Data cable CU-DU (2m)
- Data cable CU-OP (2,2m)
- Attachment screw 3pcs. M6x22; 3xWasher Ø 6,4; 2pcs. M5x16
- User manual

3.2 Mechanical installation

- Verify if all parts of the delivery are available complete.
- Before installing the machine verify if the machine or the accessories have transport damages.
- Verify if the installation underground is plane (installation surface).
- Verify the minimum load capacity. (See chapter: „weight“)
- Verify the operation conditions. (See chapter: „Operation conditions“)
- Verify the electrical specification. (See chapter: „Electrical specification“)

- Fix the machine pedestal (5) with two pieces screws M8 on the installation surface. (Dimensions see chapter: „Mechanical dimensions “machine pedestal“)

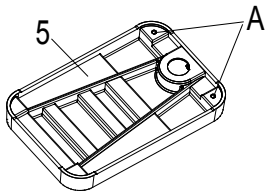


Fig.: 3.1

- Push the column (4.1) into the machine pedestal (5) just until it reaches the ground. The nut of the column has to show backwards.
- Fix the screws (A) with a torque of 20Nm.

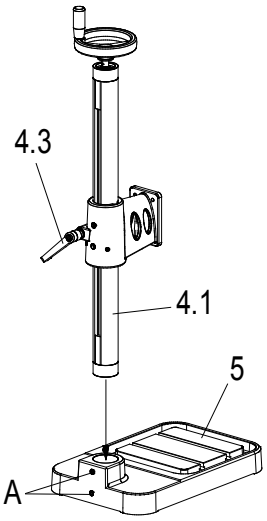
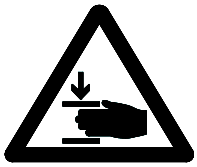


Fig.: 3.2

- Clamp the clamping lever (4.3).



- To avoid damages position a foam (B) or something similar on the machine pedestal (5). Take care that the distance between foam (B) and quick change holder (3.1) is not too large.
- Put the three peaces screws DIN912 M6x22 with washer (A) through the drilling of the column flange (4.2).
- Push the drive unit (3) onto the dowel pin of the column flange (4.2) and screw one screw down light.
- Screw down the screws (A) with a torque of 10Nm.
- Remove the foam.

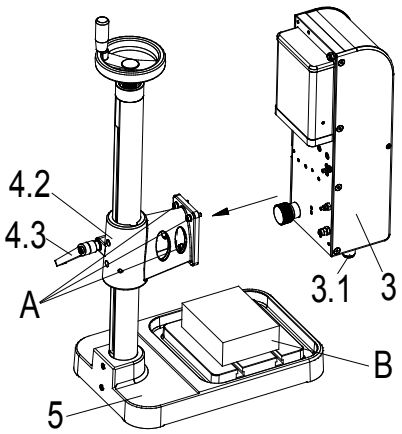


Fig.: 3.3

- Position or install the control unit at a suitable position that way that the cables are not exposed soilings directly.
  By the assembly kit fixation to the wall (1.4) (accessory) you are able to fix the control unit beside the work bench.
  (Dimension see chapter: „Mechanical dimensions control unit“)

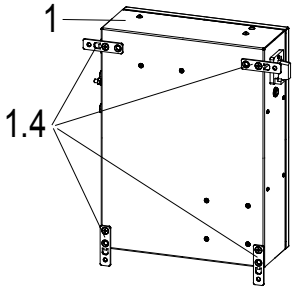


Fig.: 3.4

- Fix the articulated bracket (2.16) of the control unit (2) at the rear side of the drive unit (3) with two pieces screws DIN912 M5x16 (A).
- Screw down the screws (A) with a torque of 6Nm.

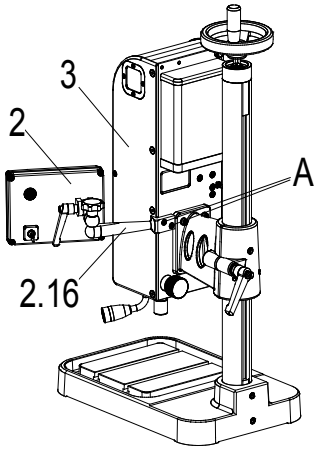


Fig.: 3.5

3.3 Electrical installation

- Connect the motor power connector X161 of the control unit (1) with the motor power cable CU-DU (4 pol) with the motor power connector X361 of the drive unit (3).
- Connect the data connector CU X162 of the control unit (1) with the data cable CU-DU (17 pol.) with the data connector DU X362 of the drive unit (3).
- Connect the data connector CU X163 of the control unit (1) with the Data cable CU-OP (7 pol.) with the data connector OP X363 of the drive unit (3).

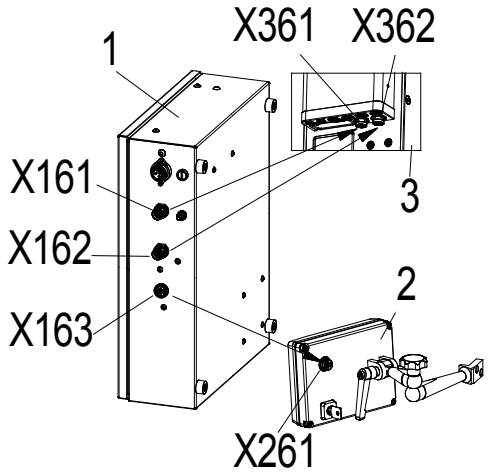
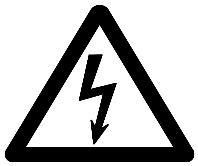


Fig.: 3.6



- The thread tapping unit has a discharge current more than 3,5mA.
  To avoid electrical electromagnetic interference and electric shock an installation of a second earth wire is neccessary (see chapter: „Earthing procedure“)
- Connect the earthing screw M6 of the cover earthing X164 of the control unit (1) with an earth wire with the earth connection (min. 10mm², cable length 2m).

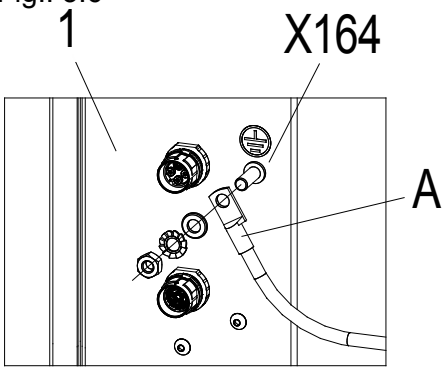


Fig.: 3.7

- Connect the power cable with the connector X160 of the control unit (1).
- Do not plug in the safety plug of the power cable! (see chapter: „Installation“)

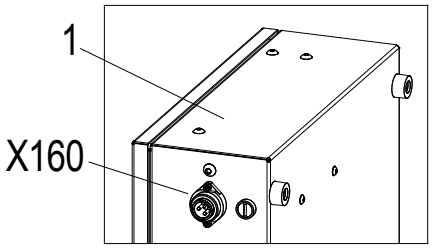


Fig.: 3.8

3.4 Commissioning

Attention

- **Important!** In case of immediate deviation of the operation conditions before installation take care that the temperature and the humidity have to be harmonised for 24 hours!

3.4.1 Brief description of components

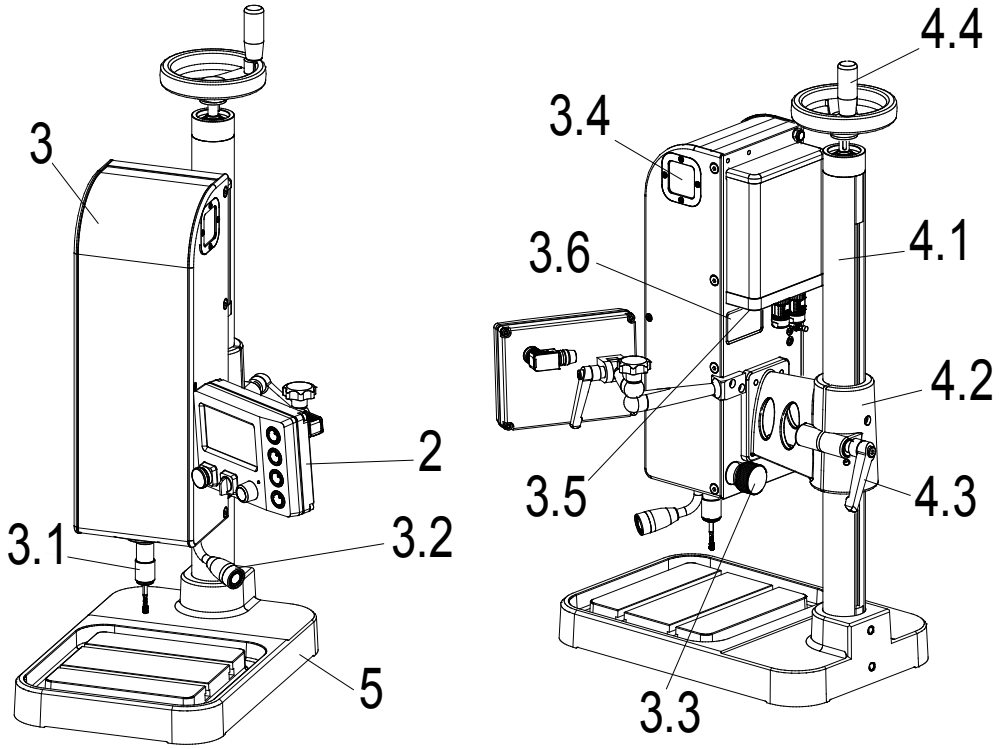


Fig.: 3.9 Rear and front view of the thread tapping machine with operating panel

(2) Operating panel (See chapter: "Operation")
(3) Drive unit Tauro® 8 / 25 / 83
(3.1) Quick change holder
(3.2) Operating lever with start button
(3.3) Adjustment wheel for the spindle counter balance system
(3.4) Air cleaner for cooling system (in)
(3.5) Air cleaner for cooling system (out)
(3.5) Type plate
(4.1) Column
(4.2) Column flange
(4.3) Clamp lever for column flange
(4.4) Handwheel for column
(5) Machine pedestal

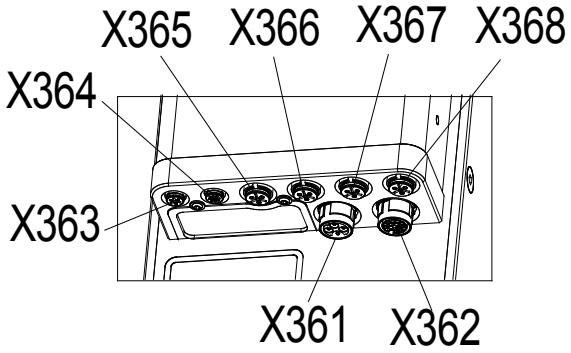


Fig.: 3.10 Connector (Rear view) of the drive unit

(X361) Motor power connector
(X362) Data connector DU
(X363) Input foot switch (black)
(X364) Input automation (black)
(X365) Output signal column (black)
(X366) Output automation (red)
(X367) Output air cleaning unit (blue)
(X368) Output lubricant unit (green)

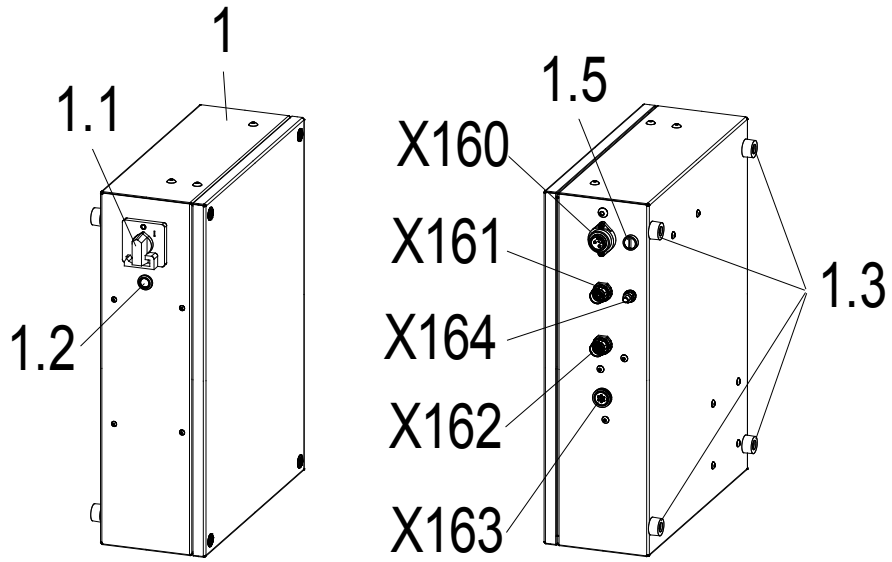


Fig.: 3.11 Rear and front view of the control unit

(1) Control unit
(1.1) Main switch
(1.2) Control lamp for main switch
(1.3) Mounting foot
(1.5) Fuse 5A T (time-lag); Type: (G-fuse 5x20)
(X160) Main connector
(X161) Motor power connector
(X162) Data connector DU
(X163) Data connector OP
(X164) Earthing screw of the earthing of the housing

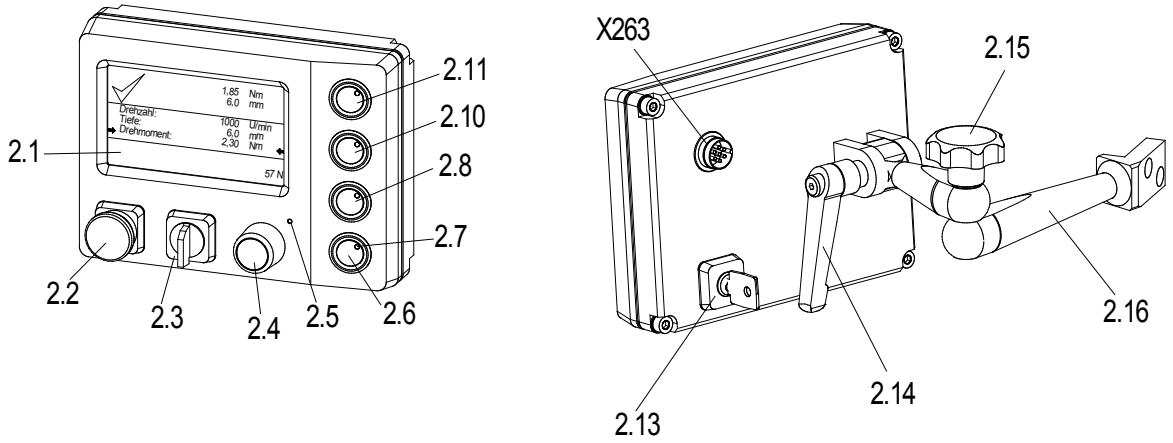


Fig.: 3.12 Rear and front view of the operating panel

(2)	Operating panel
(2.1)	Display
(2.2)	Emergency stop
(2.3)	Motor switch
(2.4)	Rotary knob with button
(2.5)	Rotary knob LED
(2.6)	Menu button
(2.7)	Menu button LED
(2.8-2.12)	Select buttons for the set of parameters (component part)
(2.13)	Key switch (component part)
(2.14)	Clamp lever for vertical adjustment
(2.15)	Star grip for clamping the horizontal adjustment
(2.16)	Hinged bracket
(X263)	Data connector OP

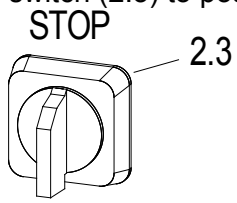
3.4.2 Turn main switch on

Secure that the machine is not damaged and the mechanical and electrical installation was realised in a workmanlike manner.

- Switch on the main switch (1.1). The control lamp (1.2) starts burning.
- A start screen appears just until the start process is finished. (approx. 13 seconds).
- The display changes to the working menu. (See chapter: „Operation“)
- The machine is ready to work now.

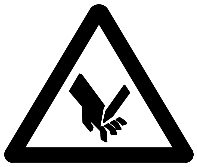
3.4.3 Tool change

1. Switch the motor switch (2.3) to position stop.



The message „Stop motor switch!“ appears in the display.

Warning: The motor switch (2.3) has to be on position stop because the drive spindle can start running.



Warnung: Tools are sharp and can cause injuries.

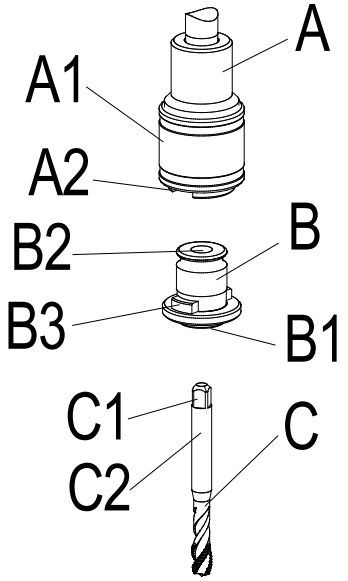
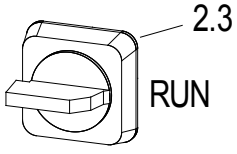


Fig.: 3.13

2. Unclamp tool (C)
   - Hold the quick change insert (B) with one hand and pull up the pressure cover (A1). The quick change insert will be unclamped in this way.
   - Press the spring dowel pin (B1) of the quick change insert (B) and remove the thread tool. (C).

3. Insert tool (C)
   - Insert the thread tool (C) into the quick change insert (B).
     The square (C1) of the thread tool has to snap in the square (B2) of the quick change insert (B).
   - Plug the quick change insert (B) in the quick change holder (A).
     The nose (B3) has to snap in the nut (A2). By doing this the pressure cover slips down and clamps the quick change insert (B).

4. Switch back the motor switch (2.3) to the position RUN.



3.4.4 Adjust the counter balance

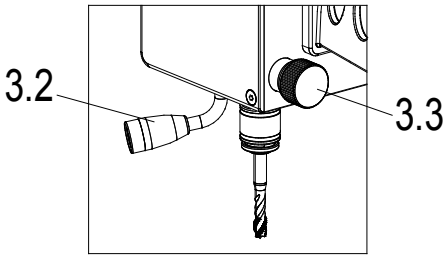
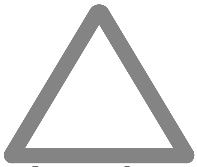


Fig.: 3.14

The retraction force of the drive spindle can be set by the adjustment wheel (3.3).
Pull down the drive spindle by the operating lever (3.2).
If you release the operating lever (3.2) the drive spindle should be brought back in the end position by its own because of the balance system. Take care that the retraction force is not set to high!



Attention!
A too powerful retraction force reduces the lifetime of the thread tool and can affect the quality of the working process.

By turning the adjustment wheel to the right side the retraction force of the drive unit becomes stronger.

3.4.5 Adjust the workpart and height adjustment

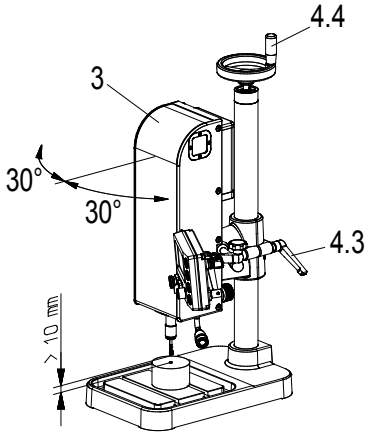


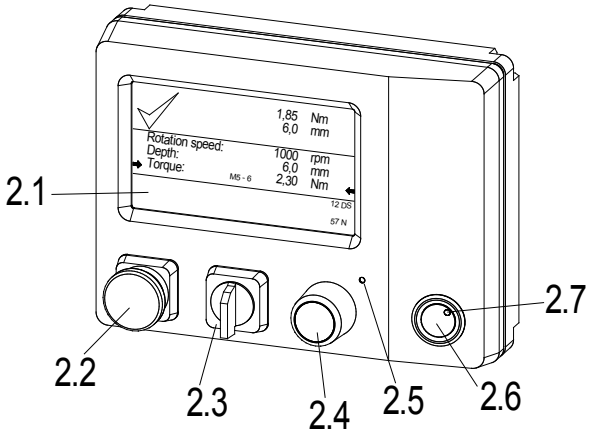
Fig.: 3.15

- Open the clamping lever (4.3).
- Position the distance between spindle and workpiece higher than 10mm with the hand crank (4.4).
- It is possible to swivel the drive unit (3) around 30° to the left and to the right at a time.
- Clamp the clamping lever (4.2).
- Secure the workpiece against torsional stiffness and unwanted moving.
  Use only suitable clamping devices.

Danger: Workpieces can turn with the tool and threaten peoples and machines.

4 Operation

4.1 Functions of buttons



(2.1) Display
(2.2) Emergency stop
(2.3) Motor switch
(2.4) Rotary knob with button
(2.5) Rotary knob LED
(2.6) Menu button
(2.7) Menu button LED

(2.1) The full color 4.3 "TFT display shows operating parameters, processing results, error and fault messages.

(2.2) The **emergency stop button** stops the machine after activating (push) in the function safe stop (stop category 0 to EN 60204). The message is "STOP EMERGENCY STOP". (See chapter: "error / status message")
Unlock (pull) the emergency stop button. The machine can immediately be used again.

Note: The tool can be reversed from the workpiece if the emergency stop button is activated during processing. Therefore unlock the emergency stop button, press the start button and select safety reverse. (Tauro® 8 / 25 / 83)

(2.3) The **motor switch** is used to lock the spindle (eg: tool change).

Note: The tool can be reversed from the workpiece if the motor switch is activated during processing. Therefore unlock the motor switch, push the start button and select safety reverse. (Tauro® 8 / 25 / 83)

(2.4) The **rotary knob** with button is used to select, to adjust parameters and to confirm the measures and commands.

(2.5) The **rotary knob LED** shows the current function of rotary knob with button (2.4). Rotary knob LED on (2.4) shows activation of rotary knob.

(2.6) By pushing the **menu button** you enter the main menu and go back to the task menu.

(2.7) **Menu button LED** on displays activation of menu button (2.6).

4.2 Task menu

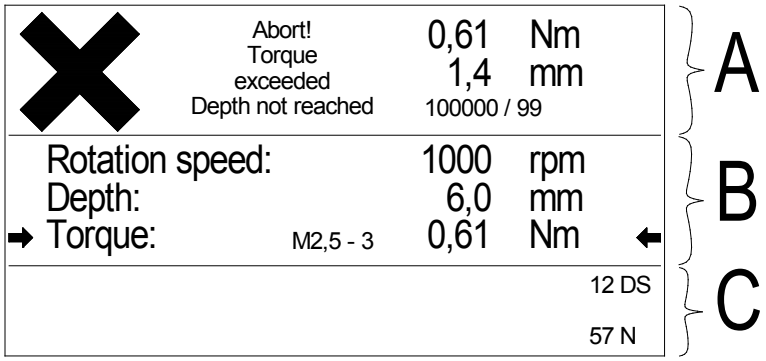
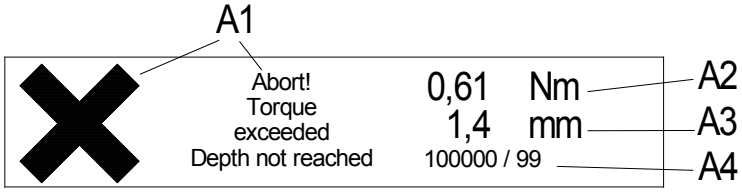


Fig.: 4.1

A **Message and quality level**



A1 messages (See chapter: "messages")
A2 torque reached
A3 depth reached

B **Adjustment level**

Rotation speed	working speed
Depth	working depth
Torque	maximum torque for the working process. The mentioned thread size is only reference value! The torque has to be under the breakage data of the tool.

C **Parameter level**

C1 Number of data set
C2 Feed force (only for the feed of the spindle positioning)

4.3 Main menu, quick reference / standard parameters

The main menu is divided into several levels.
The levels can also be represented by a path in the instructions. The last information can also be a setting.
(eg: main menu/engine settings/direction/*right*)

Task menu
Main menu
- Level 1
  - Level 2
    - Level 3

Task menu
Rotation speed: *1000 rpm*
Depth: *6,0 mm*
Torque: *1,00 Nm*

Main menu
- **Start settings**
  - Start with start button: *on*
  - Start at workpiece zero point: *off / enter parameter*
  - Start at torque detection: *off / enter parameter*
- **Processing types**
  - Threading blind hole: *on*
    - Chip breaking: *off / enter parameter*
    - Reversions: *on / 5 per cut*
  - Threading through hole: *off*
  - Thread recutting: *off / enter parameter*
  - Thread forming: *off*
  - Insert threaded bushing: *off*
    - Stop parameter: *Torque / Depth*
  - Insert bolt: *off*
    - Stop parameter: *Torque / Depth*
  - Thread gauging: *off / enter parameter*
- **Lubricant settings**
  - Lubricant pulse: *on / 0,5 seconds*
  - Air pulse: *off / enter parameter*
  - Air cleaning pulse: *off / enter parameter*
- **Motor settings**
  - Rotating direction: *right / left*
  - Reverse speed: *100%*
  - Release height: *off / enter parameter*
  - Brake depth: *off / automatic / manuel*
  - Depth progress control: *5 responsivity*
  - Feed system: *XX,X proof rotation*
- **Quality parameter**
  - Torque window: *off / enter parameter*
  - Blowhole detection: *off / enter parameter*
  - Counter: *Day counter / Workpiece counter*
  - Depth tolerance: *on / 0,5 mm*
  - Tool wear: *off / on*
- **Parameter database**
  - Default parameters r: *load*
  - User defined parameters: *load / overwrite*

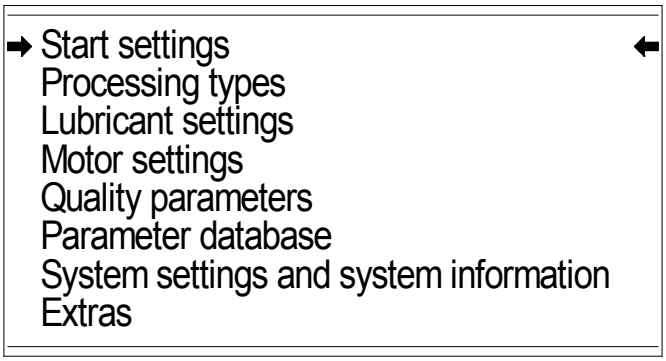
System settings and system information

Measuring unit: *mm*
Language: *english*
Display brightness: *100%*
System temperatures: *information*
System information: *information*
Last error: *information*

Extras

No extras installed

4.4 Main menu



4.4.1 Start settings

The start settings can only be set to `„*on*“. The previous startup setting is set to „*off*" by selecting a different startup setting to „*on*“.

4.4.1.1 Start with start button

Option: *on*

4.4.1.2 Start at workpiece zero point

Option: *on* and enter *parameter*
Enter parameter. Run the tool with the control handle in the bore. Save parameter, by using the rotary knob (2.4) or the start button (3.2).

4.4.1.3 Start at torque detection

Option: *on*
It is possible, if confirmed, to adjust the *starting torque* (from *0.05 Nm to peak torque*).

4.4.2 Processing types

The types of processing can only be set to „*on*“. The previous setting is set to „*off*“" by selecting a different startup setting to „*on*“.

4.4.2.1 Threading blind hole

Option: *on*
It is possible, if confirmed, to adjust chip breaking settings.

4.4.2.1.1 Chip breaking

Option: *off / on*
It is possible, if confirmed, to choose between following setting:

- *first chip breaking* (first chip breaking depth in mm)
- *interval* (interval depth in mm)
- *chip clearance depth* (chip break angle or depth to the workpiece zero point, which should be turned back by chip breaking.)

4.4.2.1.2 Reversions

Option: *on / off*
Option: *3 – 15* (maximum number of reversing)

4.4.2.2 Threading through hole

Option: *on*

4.4.2.3 Thread recutting

Option: *on*
It is possible, if confirmed, of torque reduction during ingating.
(*10 – 90%*).

4.4.2.4 Thread forming

Option: *on*

4.4.2.5 Insert threaded bushing

Option: *on*
It is possible, if confirmed, to select stop parameters:
Option: *torque stop parameter / depth stop parameter*

4.4.2.6 Insert bolt

Option: *on*
It is possible, if confirmed, to select stop parameters:
Option: *torque stop parameter / depth stop parameter*

4.4.2.7 Thread gauging

Option: *on*
It is possible, if confirmed, to boost torque while withdrawing.
(*10 – 4000%*)

4.4.3 Lubricant settings

4.4.3.1 Lubricant pulse

Option: *on / off*
It is possible, if confirmed, to adjust time, from *0,1 bis 3,0 seconds*.

4.4.3.2 Air pulse

Option: *on / off*
It is possible, if confirmed, to adjust time, from *0,1 bis 3,0 seconds*. Air pulse starts with the lubrication pulse.

4.4.3.3 Air cleaning pulse

Option: *on / off*
It is possible, if confirmed, to adjust time, from *0,1 bis 3,0 seconds*.

4.4.4 Motor settings

4.4.4.1 Rotating direction

Option: *right / left* (right / left hand thread)

4.4.4.2 Reverse speed

Option: *20% to 1000%*
rpm is always limited to the minimum or maximum rpm.

4.4.4.3 Release height

Option: *on / off*
It is possible, if confirmed, to enter parameters above the workpiece zero point (from *5 mm to maximal feed*). This is a virtual start position at which the machine can already be started again.

4.4.5 Quality parameter

4.4.5.1 Torque window

Option: *off / on*
It is possible, if confirmed, to set *torque tolerance* starting *from 0.1 Nm*.
Torque used during processing must not exceed maximum torque in the task menu and the maximum torque, less torque tolerance.
Measuring range is set between *start depth* and *stop depth*.
(stop depth e.g. for tap clearance hole)
(See chapter: "Quality Notifications")

4.4.5.2 Blowhole detection

Option: *on / off*
It is possible, if confirmed, to set *torque decrease in %* (*5 - 95%*).
End of the measuring range is set by stop depth.
(stop depth e.g. for tap clearance hole)
(See chapter: "new messages")

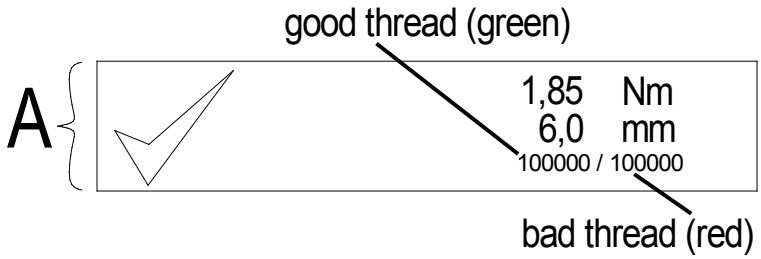
4.4.5.3 Counter

Counter can only be set to „*on*“. By starting next count previous count is set to „*off*“.

4.4.6 Day counter

Option: *on*
It is possible, if confirmed, to *reset* day counter.
Day counter is being reset at machine startup.

Display while processing:



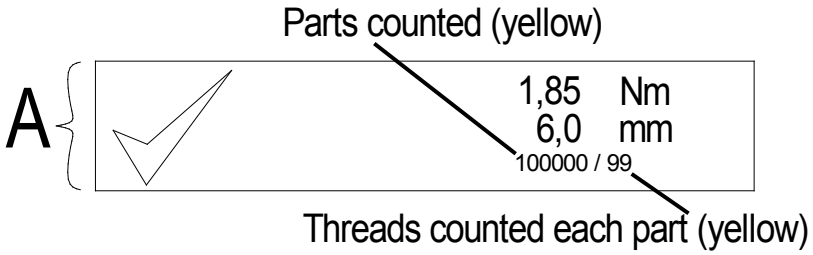
4.4.6.1.1 Workpiece counter

Option: *on*
It is possible, if confirmed, to set counter options and parameters.

Option:
Abort after confirmation - last part can be reset by confirmation, if an error occurs.
Abort after a faulty thread - last part must be reset by confirmation, if an error occurs.
Abort after a faulty workpiece - last part must be reset after completion of the processing of the part by confirmation.

workpieces -set quantity
threads per workpiece - set
reset of counted workpieces

Display while processing:



4.4.6.2 Depth tolerance

Option: *on / off*
It is possible, if confirmed, to adjust depth tolerance from *0mm - 6mm*.
(see: brake depth)
(See chapter: "Quality messages")

4.4.6.3 Brake depth

Option: *off / automatic / manual*
Machine calculates brake depth during processing. This is necessary for careful processing. Due unfavorable processing parameters (eg, low torque, high speed, high pitch), depth can be exceeded. Avoid this by changing the processing parameters, or adjusting the brake depth.

- *off* brake depth is off (eg for applications with high processing sequences of through threads).
- *automatic* brake depth is automatically calculated by the machine during processing.
- *manual* brake depth can be adjusted manually in low processing parameters.

4.4.7 Parameter database

4.4.7.1 Default parameters

Option: *load*
It is possible, if confirmed, to reset the entire parameters to default parameters. (See chapter: "default parameters")
(Please wait 3 seconds!)
In the the message area of the working menu the data set „0 DS“ is displayed.

4.4.7.2 User defined parameters

Option: *data set*
After selecting the data set number it is possible to *load* or to *overwrite* this data set.
(Please wait 3 seconds!)
In the message area of the working the selected data set is displayed (e.g. 12 DS).

4.4.8 System settings and system information

4.4.8.1 Measurement unit

Option: not active (*mm / inch*)

4.4.8.2 Language

Option: (*german / english / spanish)*

4.4.8.3 Display brightness

Option: not active (*10 - 100%)*

4.4.8.4 System temperatures

Information: not active

4.4.8.5 System information

Information: not activ

4.4.8.6 Last error

Information: last error (for service)

4.4.9 Extras

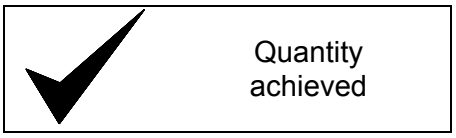
No extras installed

5 Messages

5.1 Quality notifications

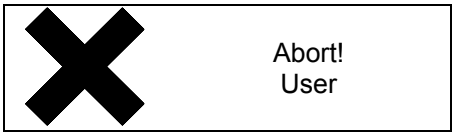
Quality notifications „ Good “

Quality good.

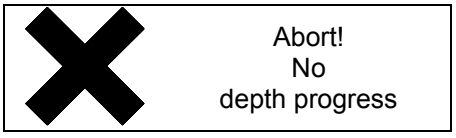


Quality good,
Quantity has been achieved.

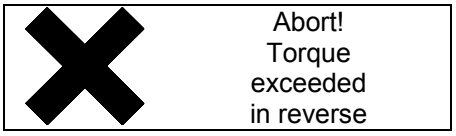
Quality notifications „Abort“



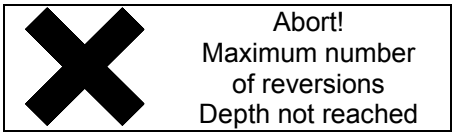
Processing canceled by user using manual start button or foot switch.



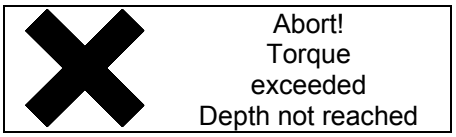
Spindle has not progressed at processing start during certain period of time.



Torque has been exceeded in reverse.
Drive spindle stops.
Drive spindle can be reversed in safety reverse mode with 50 rpm by using start button.

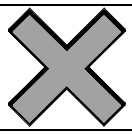
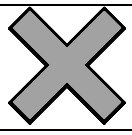
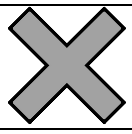
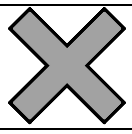


Threading blind holes:
The set number of reversions has been exceeded.
e.g. tool wear, grounding, improper cutting speed
Path: Main Menu/Engine Settings/Reversions

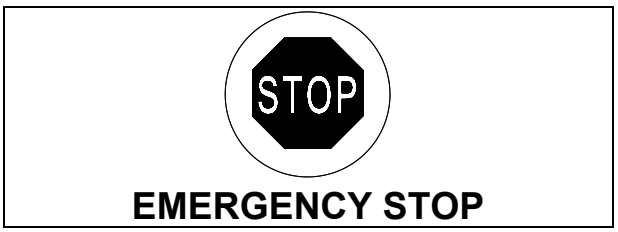


Threading canceled!
Threading through hole: Processing will be stopped immediately after exceeded torque.
Threading blind holes: Tool has reversed 3 times without progress in depth.
e.g.: grounding

Quality notifications „Error “

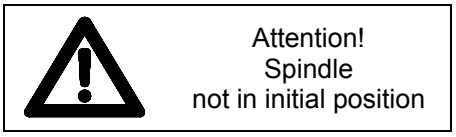
 *Error! Gating*	*The infeed of drive spindle was moved in positive direction after setting the zero point. (in direction up)*
 Error! Below torque range	The torque has slightly dropped during processing. e.g.: pipe cavities or air pockets in cast material Path: Main menu/Quality Parameters/Pipe Cavities
 Error! Blowhole detected	The torque has slightly dropped during processing. e.g.: pipe cavities or air pockets in cast material Path: Main menu/Quality Parameters/Pipe Cavities
 Error! Depth tolerance exceeded	Adjusted depth tolerance was exceeded. Thread with large pitch, high speed and low torque is being processed,. Change depth tolerance, correct the speed or set the brake depth manually (See chapter "Operation") Path: Main Menu/Quality Parameters/Depth tolerance

5.2 Error message / status message

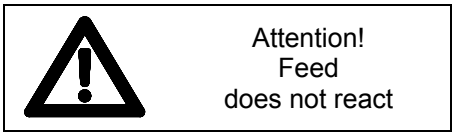


Emergency stop button (2.2) has been operated.
Check and correct malfunction.
Unlock (pull) emergency stop button

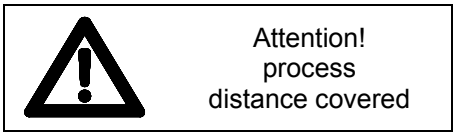
Engine switch has been operated.
Drive spindle is locked!
Machine ready again for processing by turning the motor switch (2.3).



Spindle is not in initial position after power or exiting a menu position.
Run back spindle into initial position.



The feed does not react after starting the foot switch.
Check the air supply.



The maximum travel range of the drive unit was reached.
Correct the infeed travel.

5.3 Error code

An hardware error has arrived.
(See chapter " Troubleshooting / Error code")

6 Digital inputs and outputs

6.1 Technical data of inputs and outputs

- **Digital inputs 3 pcs:**

Type of Inputs	digital isolator
Rated voltage	24VDC +/- 10%
Voltage range	0…30V
Input current	approx. 0,5mA
Signal voltage on	min. 15V
Signal voltage off	max. 5V
Delay input	> 10ms (0 to 1 and 1to 0)
Potential separation	none
Protective circuit	short-circuit proof, thermal cut-out, inverse-polarity protection
Connection	circular connector Ø 11,5 / IP67 cable bushing 3-5mm terminal cross-section max. AWG 24 / 0,25mm²

Note: A digital exit of a PLC control can be layed directly (without additional load) to a digital input.
Proximity switches (e.g. inductive proximity switches PNP) can be connected to a digital input directly.

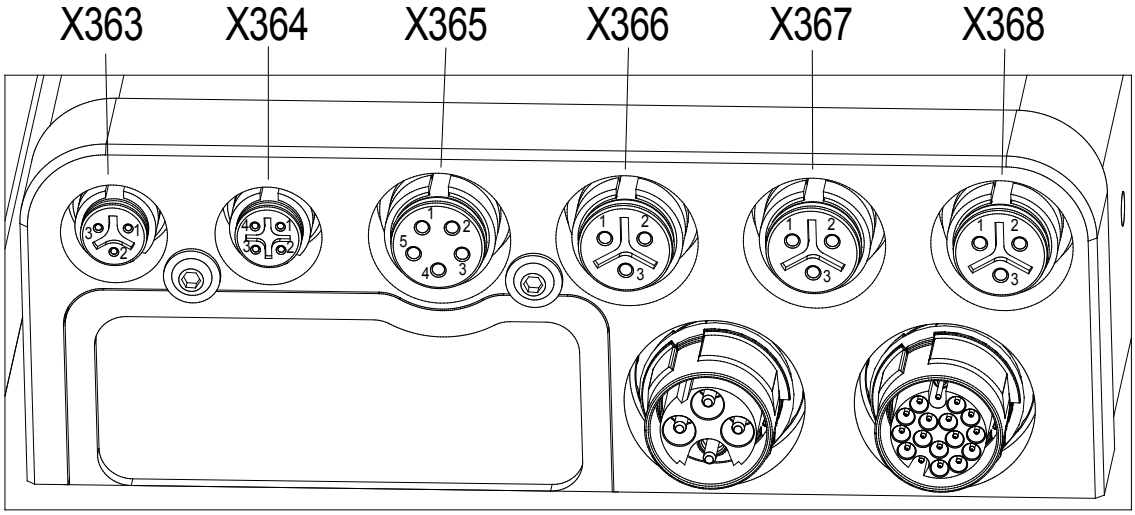
Warning: By a short circuit at the 24V power supply of the digital inputs a start pulse can be triggered.
The feed of the spindle will be started and the drive unit starts turning automatically.

- **Digital outputs 10 pcs:**

Digital outputs	24VDC / 3,6W (short-circuit proof)
Type of outputs	transistor
Rated voltage	24VDC +/- 10%
Rated current	150mA per output
Rated burden	3,6W per output
Potential separation	none
Protective circuit	short-circuit proof, thermal cut-out, inverse-polarity protection
Connection	circular connector Ø 16 / IP67 cable bushing 4-6mm (2,5-4 / 6-8 optional) terminal cross-section max. AWG 20 / 0,75mm²

Note: A digital exit can be layed directly (without additional load) to a digital input of a PLC control.
Valves can be connected to a digital exit directly.

6.2 Terminal connection of inputs and outputs

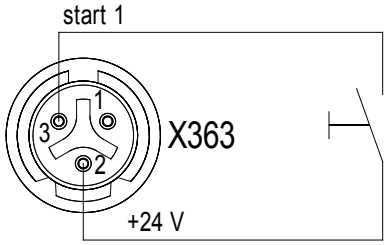


connector	description	Rated current	max current (<3 sec.)
X363 /	Input foot switch (black)*		
1	GND		
2	24V	75mA	90mA
3	Input start 1 (foot switch)		
X364 /	Input automation (black)*		
1	GND		
2	24V	75mA	90mA
3	Input start 2		
4	Input start button 2		
X365 /	Output quality / QA (black)		
1	GND		
2	Output signal horn	150mA	180mA
3	Output signal light red	150mA	180mA
4	Output signal light orange	150mA	180mA
5	Output signal light green	150mA	180mA
X366 /	Output automation (red)		
1	GND		
2	Output clamp thread	150mA	180mA
3	Output clamp workpiece	150mA	180mA
X367 /	Output air cleaning unit (blue)		
1	GND		
2	Output air cleaning pulse	150 mA	180 mA
3	Output ready signal	150 mA	180 mA
X368 /	Output lubricant unit (green)		
1	GND		
2	Output lubricant unit air	150mA	180mA
3	Output lubricant unit pulse	150mA	180mA

* Only with feed system for the spindle!

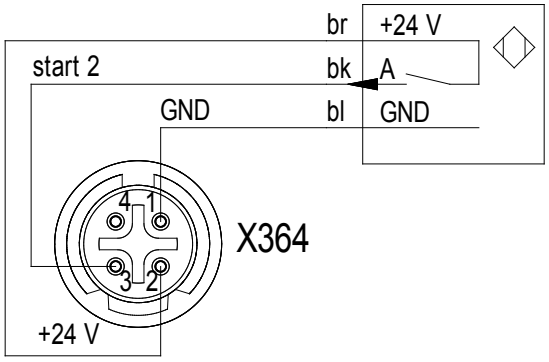
6.3 Wiring examples of the inputs and outputs

- **Requirements input**: The external start pulse of the thread tapping unit should happen by an external manual button. (Only with feed system for the spindle)
  Attention: By operating „Stop! User“ during the operation the operation can be cancelled.
  This function is no **Emergency Stop** function!

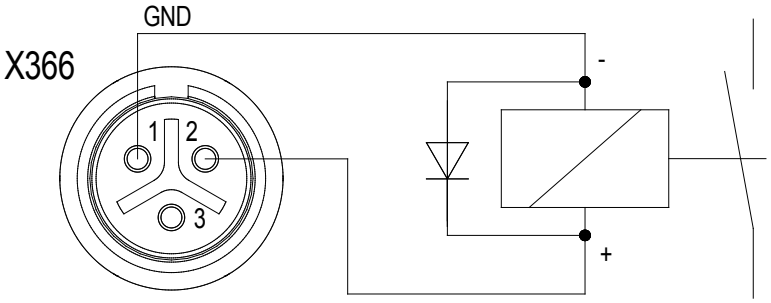


- **Requirement input:** The external start puls of the thread tapping unit should happen by an inductive proximity switch.
  (Only with feed system for the spindle)

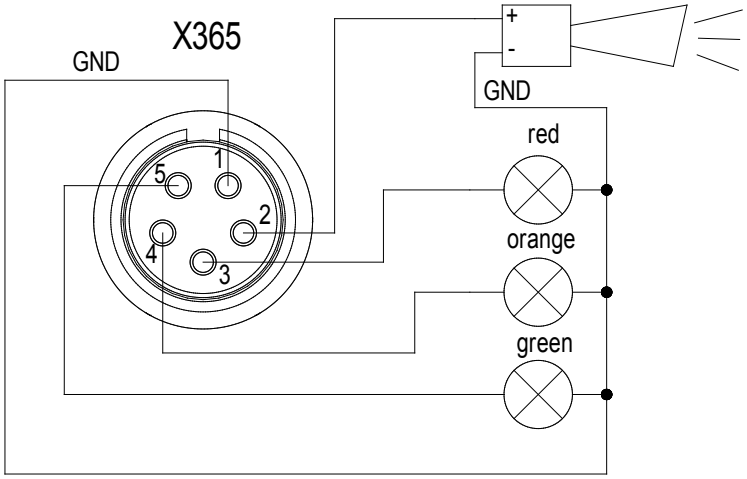
  Wire the input automation (X364/3 Start 2) with an inductive proximity switch PNP.



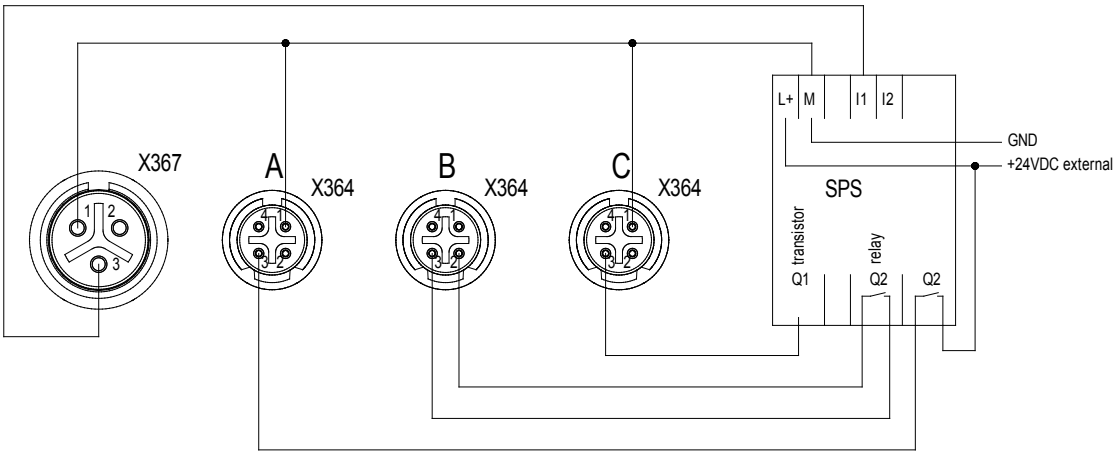
- **Requirement exit:** A relais or a valve for a clamping unit should be connected.
  Wire the exit automation (X366) with a relais or a valve.
  Respect the direction of the freerunning diode if present. (A freerunning diode is not neccessary)



- **Requirement exit:** A warning lamp with horn should be installed for quality control.
  Wire the exit signal column (X365) with various lamps and horn.
  (You can order a signal column with horn as accessory)



- **Requirement input and exit (PLC):** The thread tapping unit should be integrated in automation by a PLC control.
  Wire the exit of X367/3 ready and the input X364/3 Start 2 to a PLC – unit.



Option A:
The input of the thread tapping unit is connected to a relais exit of a PLC control. (external power supply)

Option B:
The input of the thread tapping unit is connected to a relais exit of a PLC control. (internal power supply)

Option C:
The input of the thread tapping unit is connected to a transistor - exit of a PLC control.

7 Diagnostics / Troubleshooting

7.1 Troubleshooting / Error code

Display on the screen (2.1)

Error code
1234

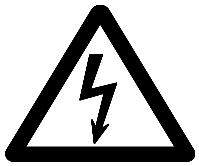
An hardware error occurred.
Based on the following list check the error code numbers and proceed as follows.

Problem / Error code	Reason	Retification
The control lamp (1.2) doesn't shine	- No power supply - Hardware error	- Check the voltage supply - Check the saftey fuse (1.5)
No display in the screen (2.1)	- No power supply - Cable dective - Hardware error	- Check if the control lamp (1.2) is shining - Check the data cable OP between the connectors X163 and X261
1001 1002	- Hardware error	- Check the data cable OP between the connectors X163 and X261
1003	- Hardware error	- Check the data cable DU between the connectors X162 and X362
1004 1050	- Hardware error	- Inform the technical service
1060	- Temperature of the drive unit is exceeded	- Switch off the machine and let it cool down
1061	- Temperature of the drive unit is undershoot	- Switch off the machine and regard chapter: "Operating conditions"
1070-1072	- short time power interruption	- Press and unlock the emergency Stopp button
1080-1083	- Hardware error	- Inform the technical service
1084	- motor switch has been activated during processing	- Switch off the machine, wait approx. 2-3 minutes and switch it on again
1300	- Hardware error	- Inform the technical service
1301	- Error in voltage supply - Hardware error	- Check the voltage supply
1303	- motor power cable - Hardware error	Check the motor power cable between connectors X161 and X361
1305	- Hardware error	- Inform the technical service
1306	- Hardware error	- Switch off the machine, wait approx. 20 minutes and switch it on again
1307	- Temperature of the control unit is exceeded	- Switch off the machine and let it cool down

Problem / Error code	Reason	Retification
1308	- Motor temperature - Hardware error	- Switch off the machine and let it cool down
1309	- Hardware error	- Check the data cable DU between the connectors X162 and X362
1310-1342	- Hardware error	- Inform the technical service

To switch off the error message: Switch off the machine by the main switch (1.1).

If the error messages still appear again after switching off and on the machine by the main switch (1.1) please inform the technical service.



Attention! Repair of electric devices are only allowed by qualified personnel. Based on not qualified repairs substantial risks can happen

Please inform the technical service in case of defective or a sending back.

In every case state the serial number and the cause of the error or the error code.

7.2 Contact Service

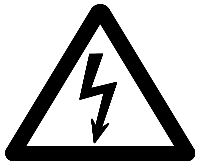
Taurox e. K.
Service
In der Stockleiten 8
94372 Rattiszell
Germany

Phone: +49 (0)9964 / 6010141
Phone: +49 (0)9964 / 6010140
Fax: +49 (0)9964 / 6010139
E-Mail: service@gewindebearbeitung.de

Note!
To avoid transport damages send the machine back in the original packaging.

Transport damages caused of improper packing the company ***Taurox e. K.*** is not liable for.

8 Servicing



Danger: Switch off the machine and cut it from the power supply before doing maintenance work.

8.1 General maintenance work

- Keep the machine and the cables free of permanent contamination.
- Do not clean the machine with aggressive cleaning compounds.

Attention: Do not use compressed-air to clean the machine.

8.2 Change air filter

- Check the air filter every 6 months to contamination and change it if neccessary.

- Replace the air filter every 2 years.
  Air filter: Air incoming (3.5) article no.: KA107A
  Air filter: Air output (3.4) article no.: KA124A

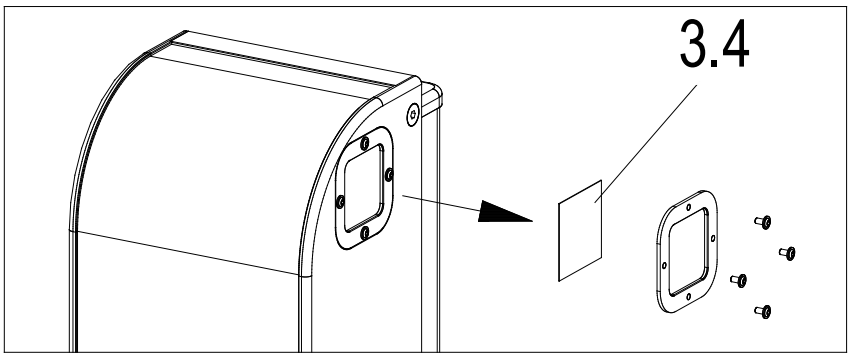


Fig.: 8.1 Air filter changing air output (3.4)

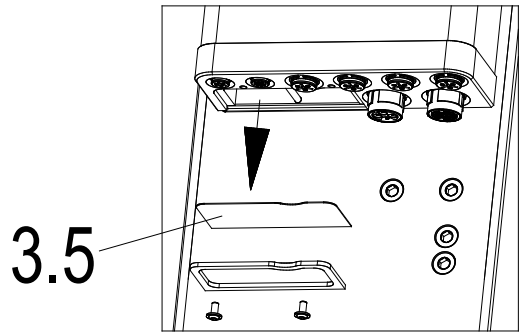


Fig.: 8.2 Air filter changing air incoming (3.5)

9 Wiring diagramn

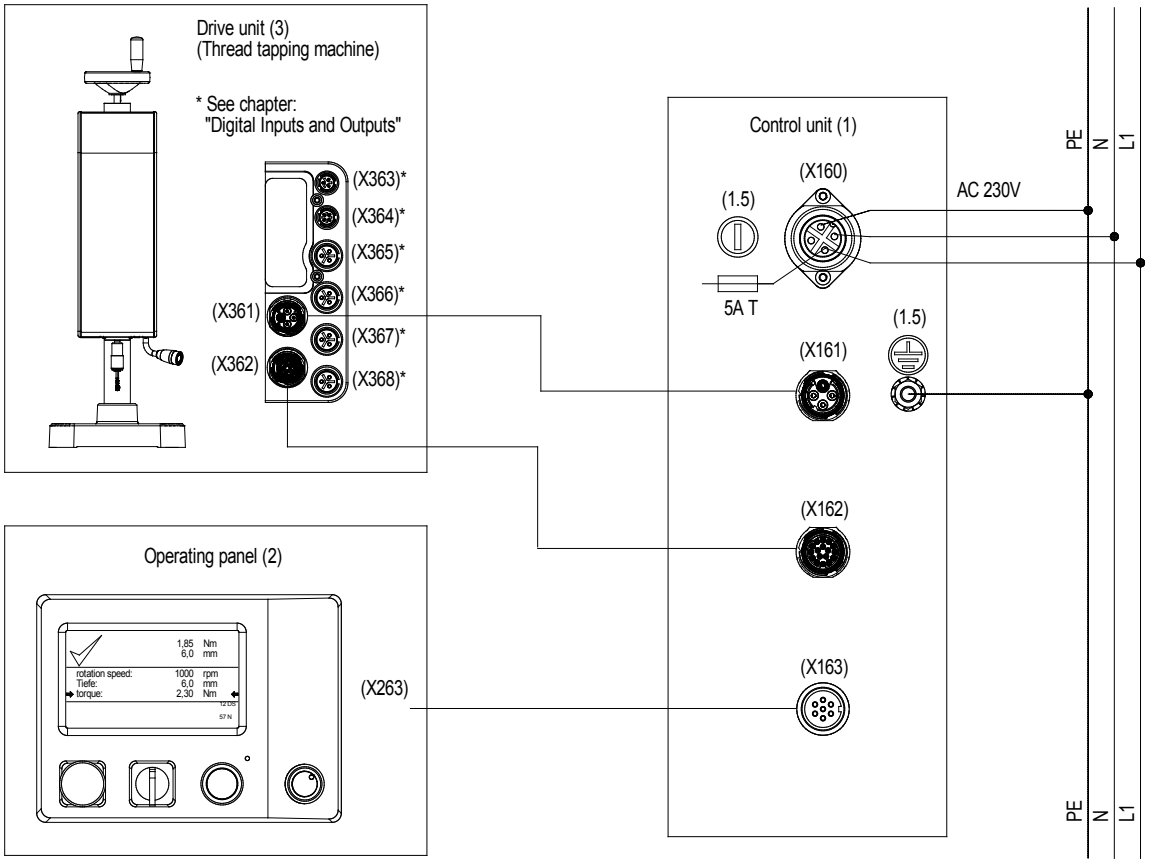


Fig.: 9.1: Connection diagram ***Tauro® 8 /25 / 83***

(See chapter: "Electrical Installation")

10 Appendix A: Component part

• Collet inserts	ER11 (**Tauro® 8**)
• Quick change inserts	Size 0 (**Tauro® 25**)
• Quick change inserts	Size 1 (**Tauro® 83 /120 / Taurox®300**)
• Quick change inserts	Size 1 (**Taurox® 400 / 900**)
• Spindle feed system	with foot switch (pneumatic 87psi / 6bar)
• Minimum lubricant unit	lubricant pulse, air pulse (pneumatic 87psi / 6bar)
• Minimum lubricant unit	lubricant pulse, air pulse, air cleaning pulse (pneumatic. 87psi / 6bar)
• Signal column	red, orange, green and horn
• Key switch	with lock-out
• Additional push buttons	selection for parameter data base
• fixation to wall	assembly kit for fixation to wall (control unit)

11 Appendix A1: Quick change inserts

Insert Size ∅ / □	tap DIN 371	tap DIN 374/376	Quick change system		
			Tauro® 25 Size 0	**Tauro® 83/120 Taurox® 300** Size 1	**Taurox® 400/900** Size 2
2,5/2,1	M 1 - 1,8	M 3,5	**X**	X	
2,8/2,1	M 2 - 2,6	M 4	**X**	**X**	
3,15/2,5			X	X	
3,5/2,7	M 3	M 4,5 - 5	**X**	**X**	
3,55/2,8			X	X	
4,0/3,0	M 3,5		X	X	
4,0/3,15			X	X	
4,5/3,4	M 4	M 6	**X**	**X**	
5,0/4,0			X	X	
6,0/4,9	M 4,5 - 6	M 8	**X**	**X**	**X**
6,3/5,0			X	X	X
7,0/5,5	M 7	M 9-10	X	X	X
8,0/6,2	M 8	M 11	X	**X**	**X**
9,0/7,0	M 9	M 12		X	**X**
10,0/8,0	M 10			X	**X**
11,0/9,0		M 14		X	X
11,2/9,0				X	X
12,0/9,0		M 16		X	**X**
12,5/10,0				X	X
14,0/11,0		M18			X
14,0/11,2					X
16,0/12,0		M20			**X**
16,0/12,5					X
18,0/14,0					X
18,0x14,5		M22-M24			X

- Adaptor to reduce Size 1 auf Size 0
- Adaptor to reduce Size 2 auf Size 0
- Adaptor to reduce Size 2 auf Size 1

12 Appendix A2: Minimum lubricant unit

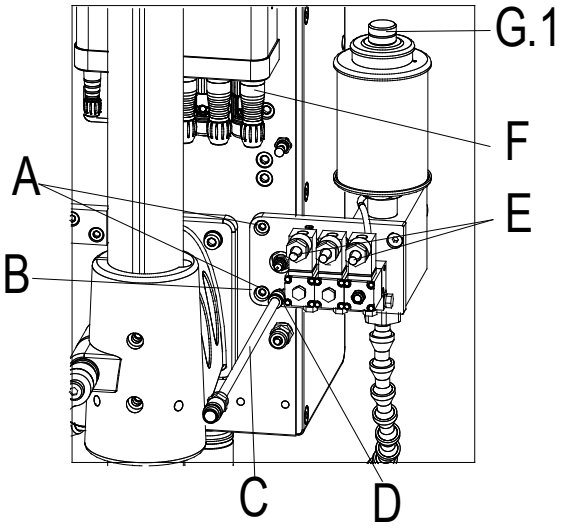
lubricant pulse, air pulse, air cleaning pulse

Scope of delivery

- Minimum lubricant unit (B)
- Attachment screw (A)
- Air tube with quick fitting coupling (C)

Installation

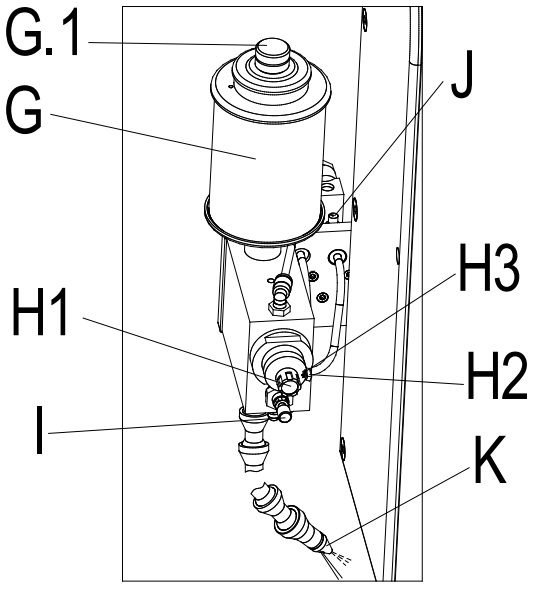
- Mount the lubricant unit (B) with the screws (A) at the rear side of the machine.
- Connect the electrical connection line (E) with the connector (F) with the machine.
- Connect the compressed-air hose (C) with the fitting (D).
- Connect the compressed-air hose (C) to the commpressed-air.
- Compressed-air (58 - 87psi / 4 - 6bar) cleaned with steam trap!



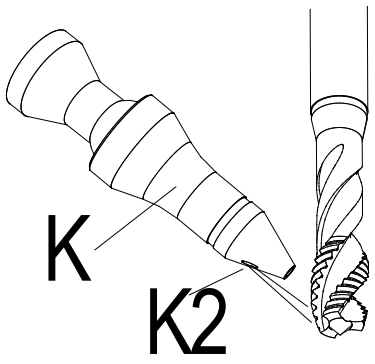
Commissioning

(G) Lubricant tank
(G1) Cover for lubricant tank
(H1) Flow controller for dosing pump
(H2) Clamp lever for quantity controller
(H3) Indicator dose quantity
(I) Adjusting screw for lubricant air
(J) Adjusting screw for air output
(K) Nozzle for lubricant and air

Wearing eye protection is obligatory!



- Set in the main menu/lubricant settings of the operation unit (2) the desired parameters:
  - Lubricant pulse: Time of lubricant pulse.
  - Air pulse: Time for the air which takes the forwarded lubricant by the air pulse. The lubricant will be sprayed by this.
  - Blow out pulse: Time for the blow out pulse after operation or chip clearance with chip clearance throw out depth.
- Open the cover (G1) of the lubricant tank and fill in the lubricant. Close cover (G1).
- **Bleeding:** Open the clamp lever (H2) and set the quantity control (H1) approx the value 4 to advance enough lubricant.
  Switch on the function main menu/settings/lubricant pulse (0,5 seconds).
  By every starting process a lubricant pulse will be started. Trigger several lubricant pulses as long as the lubricant will be advance out of the nozzle (K). Now turn the quantity control (H1) to the desired value and clamp it with the clamp lever (H2).
- **Lubricant pulse:** The lubricant pulse advances a minor quantity of lubricant by a dosing pump. This function forms a drop dosage.
- **Air pulse:** At minor quantities (quantity control less than 0,5) the function main menu settings lubricant / air pulse is needed, because the drop becomes to small to unstick of the nozzle (K) (adhesive force).
  By the adjusting screw of the lubricant air (I) the quantity of the air is controllable. The adjusting screw (I) should not have more than 2 cycles (forming of spray). This function in association with the lubricant pulse creates a spray dosage.
- **Air pulse without lubricant pulse:** This function can be used with lubricanting materials or for dry processing for cooling.
- **Outblow pulse:** The outblow pulse is used to clean the tool or to remove chips (Setting: Main menu/Lubricant settings/Blowout pulse).
  The quantity of air is controllable by the adjusting screw (J).
- **Adjusting of the nozzle:** Align the noozle (K) with the blow out drilling (K2) to the bottom**.**
  Adjust the nozzle to the tap hole to ensure a lubrication during the whole working process.



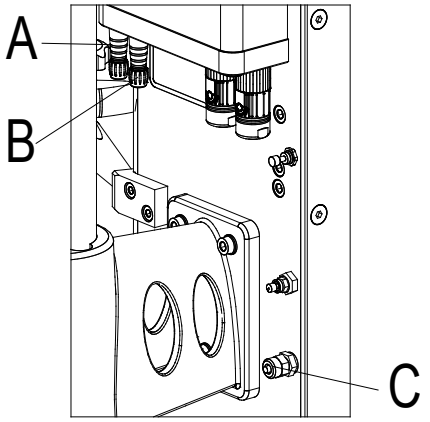
13 Appendix A3: Spindle feed system

Scope of delivery

- Air tube with quick fitting coupling
- Foot switch
- Feed is integrated in the thread tapping unit

Installation

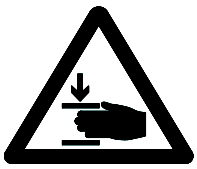
- Connect the connector (A) of the foot switch with the machine.
- For sensors you can connect the connector (B) with the machine alternatively.
- Connect the compressed-air hose to the fitting (C) and to the compressed-air. compressed-air (58 - 116psi / 4 - 8bar) cleaned with steam trap!



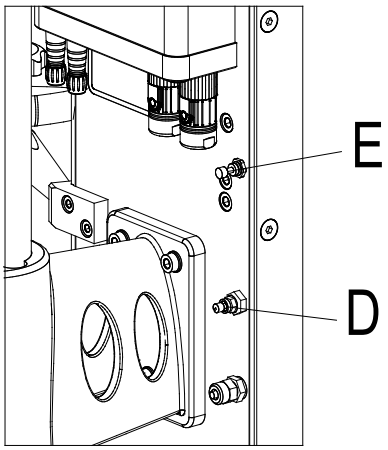
Commissioning

(D) Flow control for the speed operation control

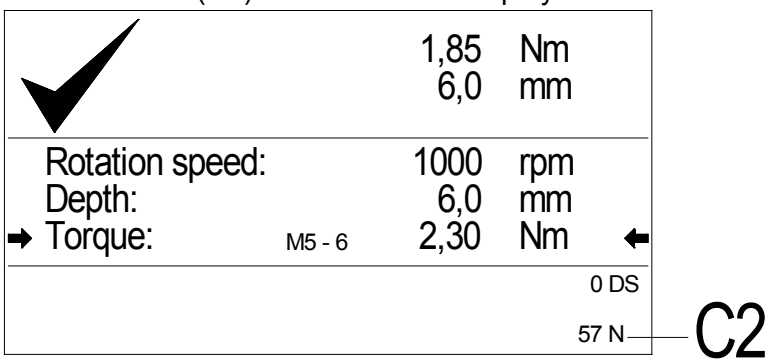
(E) Pressure control for the setting of the feed force



Hand injury warnings respectivly contusives!



- Set at the pressure control (E) the desired feed force. The feed force (C2) is shown in the display.



If the value (2) is out of the range it becomes red.

- If needed set at the nozzle (D) the desired feed force speed.

- Set in the main menu/start setting the desired start function.
  (See chapter: „Operation“)

start with the start button	The spindle start by positioning the tool at the workpiece doing this the start depth will be set to 0,0mm.
start at workpiece zero point	The spindle starts after leaving the end position. The start depth can be set in the main menu/startup settings/start at work part surface zero.
start at torque rise	The spindle starts after leaving the end position. The torque identification can be set in the main menu/start settings/start. If the start torque is exceedet the start depth will be set to 0,0mm.

- Secure the workpiece against torsional stiffness and unwanted moving.
  Use only suitable clamping devices.

Danger: Workpieces can turn with the tool and threaten peoples and machines.

- Start the feed by the foot switch or by a sensor.

Warning of automatically running!

The start process can be cancelled by a repeated pressing of the foot switch or the start button.

14 Appendix A4: Pneumatic vice

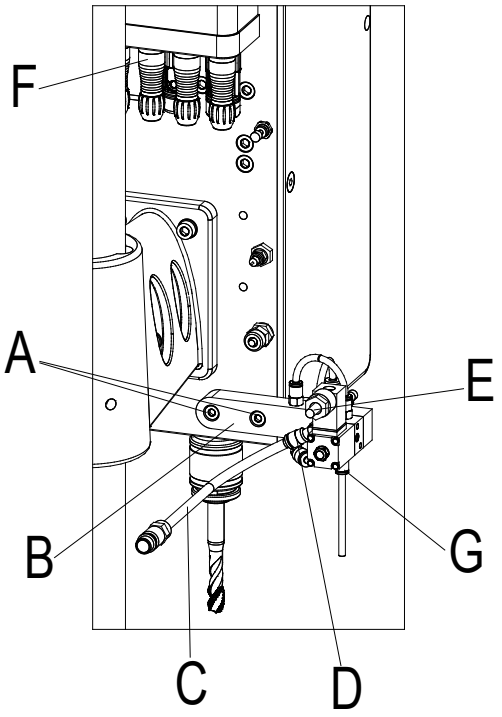
Scope of delivery

- Air tube with quick fitting coupling or air distribution
- Mounting lever with valve and pressure control

Installation

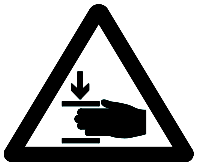
- Fix the mounting lever (B) with the two screw (A) at the rear side of the machine.
- Connect the electrical connection cabel (E) with the connector (F) of the machine.
- Connect the compressed-air hose (C) with the connection (D).
- Connect the compressed-air hose (C) to the compressed air.
- Connect the compressed-air hose of the clamp unit to the air connection (G).

Compressed air (58 - 116psi / 4 - 8bar) cleaned with steam trap!

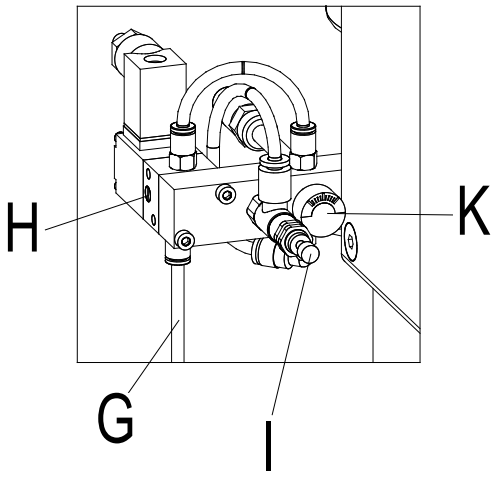


Commissioning

(G) Air connection clamp unit
(H) Manual action
(I) Pressure control to set the clamping force
(K) Pressure display



Hand injury warnings respectivly contusives!



- Set at the pressure control (I) the desired clamp force.
  With a slot screwdriver you can operate the valve manually.
- The machine sends the signal to clamp after leaving the end position automatically.

15 Appendix C: Breakage of thread tools

This breakage datas are for chipping production of thread tools.

The core diameter of a through whole thread tool is higher than a ground whole thread tool. Thereby the fraction of through whole thread tools are approx. 10% higher.

Breakage list for ground whole thread tools

Thred size	**Breakage in Nm**
M0,5	0,02 - 0,07 Nm
M0,8	0,07 - 0,10 Nm
M1	0,10 - 0,15 Nm
M2	0,2 - 0,5 Nm
M3	0,7 - 1,5 Nm
M4	1,3 - 2,2 Nm
M5	3,5 - 8,0 Nm
M6	7,5 - 14 Nm
M8	18 - 35 Nm
M10	50 - 75 Nm

These data are empirical values of tools with different qualities.
At high engine speeds it is recommended to select a low breakage as set value for the breakage.

If you need detailed breakage- and cut data of the thread tools, please ask the producer of the thread tools.
Based on the diversity of the different tools it is not possible to state the values in a list.

Thread tools for non-cutting production (thread former) have are much more stable state because of their construction and missing chip nuts.

16 Appendix D: Processing of small threads (M1)

Setting recommodation for small threads under 0,29Nm:

- Activate startsettings/start with workpiece zero point.
- Speed smaller than 300U/min. (M1 smaller 100rpm)
- Torque smaller than 0,3Nm. (M1 approx. 0,09Nm)

Additional the following parameter can be set.

- At operation thread cutting ground hole switch off the reversals.
(The operation will be cancelled after exceedance the torque)
- Turn on chip clearance and chip throw out depth

Procedure of the program function:

Under a torque of 0,29Nm a longer accelaration ramp and a stop time will be activated by turning.
Under a speed of 300rpm and a torque of 0,29Nm the internal brake depth will be deactivated to avoid an hitch.